1. What is the first string in each of the following languages?

    a. $L_u$

    b. $\overline{L_u}$

    c. $L_e$

    d. $\overline{L_e}$

    e. $L_r$

2. Determine whether each of the following languages is decidable (recursive). If the language is decidable, informally describe an algorithm to decide it. If the language is undecidable, show that if it were decidable then we could decide one of $L_u$ or $L_e$.

    a. $L = \{ \langle M, w \rangle \mid M \text{ halts on } w \}$

    b. $L = \{ \langle M, w \rangle \mid M \text{ moves right twice in a row on } w \}$

    c. $L = \{ \langle M, w \rangle \mid M \text{ moves right three times in a row on } w \}$

    d. $L = \{ \langle M \rangle \mid M \text{ accepts at least one string with odd length} \}$